EDWARD LAWRIE TATUM

1909–1975

Appreciations of his

wide-ranging service to science and humanity

by a few of his friends

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Caspary Auditorium of The Rockefeller University

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Memorial

Edward Lawrie Tatum

(1909 - 1975)

Caspary Auditorium - The Rockefeller University
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Introduction - Maclyn McCarty

Edward Tatum's professional life had extraordinary breadth. His activities in the service of science and humanity extended beyond his laboratory research, which brought him international fame, to encompass also an unusual variety of those many endeavors that support and promote the cause of science. The appreciations that you will now hear come from colleagues who were associated with him in certain of these activities. First, let me briefly indicate the nature of the associations.

Those who were his scientific collaborators I'm sure are known to all of you: Dr. Beadle, who carried out those celebrated studies with Tatum that led to their Nobel prize, and Dr. Reich and Dr. Williams who were with him at this institution.

The National Science Foundation was one of Tatum's major interests, and he served for twelve years on the National Science Board. Dr. Jewel Cobb, as a member of that Board, brings us its message of appreciation. Tatum also gave long service on advisory groups at the National Institutes of Health, and one of the unofficial fruits of this was to cement his enduring friendship with Dr. Ralph Meader, who comes now from the Massachusetts General Hospital.

Dr. Tatum was elected to the National Academy of Sciences in 1952 and thus had many years to participate in its activities. Dr. David Goddard Home Secretary of the Academy, can speak both officially and as a colleague in biological science.

I - George Beadle

It was my good fortune to have collaborated with Edward Tatum at a time when genetics and biochemistry were being brought together in an exciting and meaningful way.

Earlier I had worked in Paris with Boris Ephrussi in producing evidence in Drosophila eye pigmentation suggesting a one-to-one relation of gene and enzyme. Later in our separate laboratories we teamed up with biochemists in attempts to more deeply probe the relation. Tatum joined me in the effort at Stanford.

We made substantial progress, but the going was rough for we were dealing with eye pigments of unknown chemical makeup.

In attempts to improve my limited knowledge of biochemistry I attended a course in comparative biochemistry given by Tatum. During his discussion of the nutritional requirements of some of the filamentous fungi it occurred to me that with the red bread mold Neurospora, whose genetics was by then well understood, we might well more quickly fathom the relation of genes to biochemical reactions by inducing mutations that interrupted synthesis of known vitamins and amino acids.

Tatum quickly determined that Neurospora prospered on a known culture medium containing inorganic salts, a sugar carbon source and one vitamin, biotin, which fortunately had just become available commercially in the form of a suitable concentrate.

Our prediction was quickly verified that we could induce many mutant types each unable to synthesize one or another vitamin or amino acid.

These were exciting times indeed and we were shortly joined by several postdoctoral fellows, among them Herschel Mitchell, Norman Horowitz, David Bonner

plus several graduate students.

With one of his graduate students, C. H. Gray, Tatum extended the approach to Escherichia coli, the mutants of which later played a decisive role in the discovery by Joshua Lederberg of the remarkable sexual stage of that organism.

All in all, progress continued on many fronts and in many laboratories. But there were skeptics, and many. One in the early stages of our work was Arthur L. Tatum, Ed's father, a pharmacologist. On a visit to Stanford in the earlier stages of our work he took me aside and said in all seriousness that he felt we were doing Edward a serious disservice by putting him in a position in which he was neither biochemist nor geneticist, thus with no good future in either field. I well recall my response: "Professor Tatum, do not worry. It will be all right." He was by no means reassured but fortunately lived to be convinced.

George Beadle

II - Jewel Plummer Cobb

The National Science Board wishes to convey its profound grief on the loss of Nobel laureate Dr. Edward L. Tatum, a distinguished and respected scientist and educator. Of all of the years he spent in dedicated teaching and brilliant research the Board especially notes those twelve years of service he gave as a member of the National Science Board. He was first appointed to the Board in 1956 by President Eisenhower and was reappointed for his second six year term by President Kennedy. His reappointment stands in tribute to the respect and recognition held for him by the academic and scientific community, and national leaders in government. At the time of his appointment in 1956 he was serving as Chairman of the Department of Biochemistry at Stanford University. One year later he became a Member of The Rockefeller University where he made significant contributions toward an understanding of the nutrition, biochemistry, and genetics of microorganisms.

While on the Board he shared not only his knowledge of biology, genetics, and biochemistry but his commitment to excellence in all endeavors. His indefatigable spirit and dedication are evident by his record of work on scientific issues of national and international importance. During his tenure on the Board, Dr. Tatum served on a number of Board committees including the Executive Committee, the Committee on Biological and Medical Sciences (both as Chairman and Vice Chairman), the International Science Activities Committee, the Committee on Science Development, the Programs Committee, and several Ad Hoc committees involved with faculty salary considerations and other important matters.

Dr. Tatum was a strong advocate of international science cooperation and was also a leader in the activities of the United States - Japan Joint Committee on Scientific Cooperation. Furthermore, he instituted with Dr. Masao Yoshiki an exchange of eminent Nobel laureate scientists between Japan and the United States. This program is a continuing and highly successful activity.

His career had many peaks - among them was as the recipient of the 1958 Nobel Prize in Medicine which he shared with Dr. George W. Beadle and Dr. Joshua Lederberg for work in genetics studies with microorganisms. Many current generation scientists are aware of the "one gene, one enzyme" theory developed by Dr. Tatum and Dr. Beadle following experiments with Neurospora mutants produced by x-irradiation. Another peak was his appearance as a member of the National Science Board on February 16, 1959 before the Subcommittee on Independent Offices of the House Committee on Appropriations. His statement so clearly expresses the exceptional scientist and human being that he was that I quote it here:

> "I think the general philosophy on which science and accomplishments rests and the philosophy which has guided the Foundation and other research supporting institutions in this country is concentrating on excellence in a man, in the development of his capacities, in making it possible for him to use these capacities, both for research and for training the next generation. This is a continual process. I think the main important thing in my mind is the emphasis on excellence

of the individual not so much whether it is a particular research program in a given area, whether it may not be immediately practicable in its application but freedom to develop the intellectual curiosity and abilities of the individual thereby adding to the sum total of human knowledge."

Indeed we have just lost an exceptional human being with that excellence he described. His death is a loss to science, to the United States, and to his many friends and former students.

Jewel Plummer Cobb

III - David R. Goddard

Professor Tatum was elected a member of the National Academy of Sciences in 1952 and was an active member until his recent illness made it impossible for him to serve on Academy Committees. Today, I have been asked by the President of the National Academy of Sciences to represent the Academy as we gather here to honor our late colleague and friend.

I had the good fortune to know Edward Tatum for more than thirty years, and to count him a friend. I first knew of Edward Tatum when George Beadle in the fall of 1941, sent me a manuscript copy of a paper to appear in the Proceedings of the National Academy on "Genetic Control of Biochemical Reactions in Neurospora" under the authorship of G. W. Beadle and E. L. Tatum. As we all know, this was the initial paper in their Neurospora studies that lead to the demonstration of genetic control of enzyme synthesis and later to the awarding of the Nobel Prize. In the fall of 1942, I had just become free of government duties in the desert, and Dr. Beadle invited me to give a seminar on my studies of Neurospora dormancy and activation. At that seminar at Stanford University, and in an evening at the Beadle's home, I first knew Edward Tatum as a person. Later, in 1950 and successive years, Ed Tatum and I served in the Genetics and Morphology Study Section of the National Institutes of Health. Ed Tatum was a superb member of that panel; he had a wide ranging mind and interests, critical and extensive knowledge, and the rare ability to recognize quality. He was particularly interested in, and supportive of, the young men and women and their goals in the early stages of their research careers. He always managed to see the best in them, and his recognition of the potential of these young people often brought them research grants and postdoctoral fellowships. Ed had high but objective standards, and he was not influenced by the politics of science. There are today many established investigators, who received a helping hand from Ed Tatum at a critical period in their development.

May I close with a simple remark - Ed Tatum was not only a great scientist, but a warm and genuine human being.

David R. Goddard

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Friends of Ed Tatum

I am here today, I assume, because I represent many of you who are friends of the man, Edward Lawrie Tatum, and of his family. Each of us has our own very personal experience to recall and I feel privileged to share mine with you.

At the same time that I speak of our personal experience, I am conscious that I have an unauthorized and undesignated obligation to identify and speak for several organizations with which I have been or am officially connected and for which Ed Tatum gave generously of his store of wise counsel and with which he collaborated in helping them to achieve their mission.

I speak of The Jane Coffin Childs Memorial Fund for Medical Research at Yale University through which came the fellowship funds to enable Joshua Lederberg to develop his research talents under Ed Tatum's tutelage and to undertake the research which eventually led to his sharing of the Nobel Prize with Ed Tatum and George Beadle. The Coffin Childs Fund assisted in other ways the evolution of Ed's research activities.

I speak of the National Cancer Institute and its holding company, the National Institutes of Health in the Department of Health, Education and Welfare. Not only were Ed's studies of the mutagenic effects of some carcinogenic agents of great importance in providing a lead to the mechanism of action in chemical carcinogenesis and were assisted by grants from the National Cancer Institute,

but the National Institutes of Health depended heavily upon the advice he gave in the evaluation and winnowing of the research proposals of others. I am quite aware that he gave similar service to the National Science Foundation, to the National Foundation and to many other national and local organizations all of which have had a profound influence on the development of biomedical research not only in this country but throughout the world. I am acknowledging for the National Institutes of Health his generous contributions of sage counsel and kindly but critical evaluation while he served from 1949 through 1953 as a member of the newly organized Morphology & Genetics Study Section of the NIH, from 1958 through 1961 when he was a member of the Genetics Training Committee, and from 1964 through 1966 when he was a member and chairman of the Genetics Study Section. In addition, he chaired several special review committees for research proposals that were not appropriate for the usual Study Section review.

I speak for the Massachusetts General Hospital for whose Trustees Ed served on the Scientific Advisory Committee for three years in 1970, 1971, and 1972. The scheduling of the activities of this Committee were often a problem to Ed and his family because the annual meeting was usually in the first two weeks of December and presented a potential conflict with the celebration of Ed's birthday on December 14th. Somehow, these temporal problems always were resolved and we could count on a personal reunion in Boston as well as the official participation in advice to the Trustees. His presence was always a stimulus to his many scientific colleagues and admirers on the staff at the MGH.

My first acquaintance with Ed goes back only 33 years to the summer of 1942 when we both participated in the Growth Symposium at North Truro on

Cape Cod. Ed was one of the speakers and discussants; I was one of the listeners. We arrived on the same late evening bus. Our acquaintance ripened into friendship when Ed accepted appointment to the Faculty of Yale University and we came to know the family as well.

From that time on, even after the Tatums returned to Stanford, our lives were intertwined both personally and officially. When we went to the West Coast, we shared their home at Stanford. When they came East, they visited us in Bethesda. When Ed moved to the Rockefeller University, he and Vi came to us in Bethesda, in Boston and New Hampshire and we to them in New York. When Ed was preparing to go to Stockholm and we were discussing the proprieties of dressing for the Nobel ceremonies, we were delighted to offer my formal suit (tails). It was one way vicariously to share in the fun. Subsequently we learned that my clothes were a bit to ample for Ed's lean frame but they fitted Howard's better upholstered form so they went to Stockholm anyway. Our children have a feeling for the family warmth this relationship has generated. Our latest and saddest physical reunion was with Ed alone in New Hampshire where he found the logs in our great fireplace a comfort even in August. We continued to keep in touch by telephone up to the end. It was a wonderful friendship for us all.

I am sure each of you has many thoughts this occasion evokes. I am happy to have had this opportunity to share some of ours with you.

Remarks by Ralph G. Meader, Ph.D. at the Memorial occasion for Edward Lawrie Tatum, Ph.D., at The Rockefeller University on December 11, 1975

I got to know Ed Tatum when he arrived at Rockefeller nearly 20 years ago, and I will try to tell you a little of why he is unforgettable. During the mid-fifties, wishing to do research and needing to learn about modern biology, I was naturally attracted to Ed's lab since it was obviously an active and interesting place; however, there was something special about it, because in following the careers of people emerging from several leading labs, his seemed unique in the large number who had gone on to establish themselves as significant and independent contributors, and in a variety of different fields. By inquiring among common friends, acquaintances and his former colleagues, I found an effusion of warmth and affection; people seemed glad to have the chance to say how fond they were of him, and I was delighted when, after several meetings, he offered me a spot in his lab.

Ed's way with graduate students was unusual; he thought that they had to develop their own scientific initiative and some degree of independence at the very beginning of their careers by selecting a thesis problem of their own, and he forced them to do so but entirely at their own pace. Once they had made this basic decision and gotten to work, he showed his interest and provided support, encouragement and help on a continuing basis and in many ways. Because he fostered independence in his students, he was also able to offer them friendship rather than paternalism, and this was why they developed so much affection for him.

Ed was remarkable for his informality, openness and accessibility, and these qualities expressed themselves strongly both in his scientific and personal activities. He was strictly anti-dogmatic and was receptive to any new idea, however unorthodox, and he willingly and

actively supported research initiatives in unfashionable areas, especially if he detected any hint of novelty. During his Rockefeller period, he continued to inspire, support and participate in a wide range of research projects. In his own research, and by interaction with other laboratories, he promoted the application of the mold Neurospora in a series of new areas; these included studies of cytoplasmic inheritance, mitochondrial biogenesis, genetic and enzymatic control of cell and colony morphology, and membrane physiology. He also supported and participated in studies of antibiotic biosynthesis and antibiotic mechanism, as well as developments in cell culture and microsurgical techniques. In all of this research, and independent of his degree of public identification with it, his support was generous, enthusiastic and positive.

The same qualities were evident in his non-scientific interactions with people. Although the consequences of his eminence had pre-empted much of his time, he remained easily accessible to all kinds of people, particularly to those in need, many of whom he tended to adopt. He was an attentive and sympathetic listener, and he heard what people said, revealing his interest by tenaciously remembering and acting on small details of what he was told. Although he never sought responsibility or authority, he always accepted and carefully discharged those that were thrust upon him. He made few demands on others, and enormous ones on himself, and his scientific and personal activities reflected commitment and interest, without self-interest. To a large extent he regarded scientific output as a by-product of his interest in people.

Ed was by nature a shy and reticent person, but he greatly enjoyed life. He played the French horn with gusto; and in his music, as in science, he did not pick the easiest works to play, he was determined not to be defeated by technical problems and he enjoyed the mastery of difficulties. He was attracted to novelties of all kinds, and responded enthusiastically to elegance in form, colour and design, collecting mementos, Christmas cards, postcards, and the like. Although he ate little, he adored food, especially sampling new and different dishes; he used to try to analyse flavors and aromas in food, just as he always enjoyed being challenged in the lab to identify fermentation products and chemicals by smell. He learned to ski late in life and pursued this with the same enthusiasm and determination that he brought to science. He was, in short, an endearing and lovable person, and his friends will never forget him.

Edward Reich

VI - Curtis A. Williams

Ed Tatum was a man I have known all my life but whom I did not meet until 1960 when I joined his laboratory. I do not mean Edward L. Tatum, the celebrated scientist. I knew of him too, of course, but only since 1950, when, as a beginning graduate student at Rutgers I had my first microbiology course and my first genetics course.

I say I knew him all my life because so many of those qualities, held up to me from childhood as human virtues, I discovered over the past 15 years in Ed Tatum. Indeed I discovered them in the first 15 weeks, finding what a child knows his or her father should be, not to the world, but rather to himself and to the child.

No man or woman is without failings, and surely Ed would have had them; but these are always in the eyes of the beholder. What I see through mine as strength, others might see as weakness. I wish only to give you my eyes for a day.

All of us, certainly, remember Ed as a man with extraordinary loyalty to those in whom he had confidence. This confidence may have been in our professional talents, when he knew them; but, more frequently it was a confidence in the friendship upon which he placed so high value. This loyalty, I believe, blossomed from the stem of midwestern conservatism, which also insists on the nurture and support of individual freedom and accountable self-determination. Along with this ethos, however, we felt a tolerance for differing opinion and human weakness. How often have we heard Ed express his disappointments in people or events with a personal amalgam of sadness and incomprehension, "I don't understand that; it was such a good beginning" and then followed by an expression of continued confidence and support, "He is such a fine person and so competent."

As often we have heard "Say, that's ver-ry nice. I wish I had thought of that." This support with humility carried over into many areas of personal encounter. One could always find wise counsel on personal or professional problems coupled, of course, with an initial denial of ability to help. He might say, "Oh, I don't know about those things. How do you feel about it?" Then he would explore a problem with you, and instill in you his own confidence and sense of individual freedom and self-determination. I remember these things first because I first found them in Ed.

But I would also like to portray for your remembrance a man of intense pleasures. These were simple pleasures without pretense and without apology. Ed was known as a very private person, and surely one ot his greatest pleasures was privacy and the intimacies of his private life. Yet, I think much of the sustaining force behind this perception was recognizable in those other activities which characterized Ed as a man who prized self-reliance. Friends were other souls to be enjoyed not instruments of cooperation or assistance.

Those of us who have been closely associated with him can remember times when he would be totally absorbed in the meticulous repair of a small, inexpensive laboratory device or a personal gadget. We also think of his pleasure in designing and making his own laboratory glassware. I remember the glass chess set that he worked as a present for Viola. He devoted many Saturday mornings to this with the same solitary intensity that he gave to his experiments the rest of the week. When he was pleased with a piece he would say, "Isn't that purrdy."

These were Ed's pleasures that we could observe but which we were not asked to share. There were other pleasures, however, which he loved to share in the company of friends. Seeking out new or interesting restaurants was one of these. Ski weekends were another. Being "Uncle Ed" to other people's small children was yet another. Ed loved these simple things not so much for what they were, but rather for what they truly represented to him. Even his disappointment with the food at a restaurant, or in people was always tempered with some redeeming feature such as the cozy atmosphere and good conversation. The snow might have been terrible for skiing, but the weather was fine and it was fun to get away with friends. Thus the experience was saved for sharing and, of course, for remembrance.

By remembering these simple pleasures, I don't imply that Ed Tatum was a simple man. He was not, as we all know. Certainly Edward L. Tatum was not. What I do wish to convey is that I will love the memory of Ed - simply.

Curtis A. Williams

Closing - Dr. McCarty

In closing, I would like to say a word about some who would have been with us today had they been able. Dr. Joshua Lederburg is out of the country, so we could not hear from this other close associate. Dr. Edwin B. Fred, President Emeritus of the University of Wisconsin, who knew the Tatum family well during those early days when Edward did both his undergraduate and graduate work at Wisconsin. was unable to make the trip to New York. His message is attached.

Finally, I must note how keenly we feel the absence of Detlev Bronk, who would have arranged this memorial gathering for his close friend had it not been for his own sudden death last month.